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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,415	06/23/2003	Toru Kuboi	16770	7754

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EXAMINER	
DUPUIS, DEREK L	

ART UNIT	PAPER NUMBER
2883	

DATE MAILED: 09/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,415	KUBOI, TORU	
	Examiner	Art Unit	
	Derek L Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-14 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-14 is/are rejected.

7)☒ Claim(s) 7 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 23 June 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6/23/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 203 in figure 7, 232 in figure 8. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. Figure 12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: the fixed mirror referred to in the specification as reference number 103 on page 17, lines 10, 16, and 18 should apparently be reference number 231.

Appropriate correction is required.

Claim Objections

4. Claim 7 is objected to because of the following informalities: "the signal light beam" in line 3 of the claim should apparently be "the signal light beams". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 8 recites the limitation "the semiconductor micromachine technology" in the last line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted

> on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-6, and 8-13 are rejected under 35 U.S.C. 102(e) as being anticipated by ***Brener (PN 6,529,652)***.

10. With regard to claims 1 and 10, Brener teaches an optical switch which optically connects optical fibers on an input side with optical fibers on an output side (see column 3, lines 39-42). The switch taught by Brener (shown in figure 2 of Brener) comprises an array unit on the input side (22-1 through 22-N and 20-1 through 20-j, 30, and 100a) and an array unit on the output side (27-1 through 27-N and 25-1 through 25-j, 35, and 100b). The array unit on the input side has signal input optical fibers (20-1 through 20-j) and at least one adjustment optical fiber (22-1 through 22-N). The array unit on the input side also has a mirror array (100a) having tilt variable mirrors (120-1 through 120-j) to deflect beams from the signal input optical fibers. The mirror array (100a) also has at least one fixed mirror (112a-1 through 112a-N) to reflect an adjustment light beam from the adjustment optical fiber (22-1 through 22-N). The array unit on the input side also has a direction adjustment mechanism (50) that adjusts a relative direction of the mirror array (100a) with respect to the input side fiber array. The array unit on the output side has an output side fiber array (27-1 through 27-N and 25-1 through 25-j) having signal output optical fibers (25-1 through 25-j).

11. With regard to claims 2 and 11, Brener teaches an optical switch (shown in figure 2 of Brener) as discussed above in reference to claims 1 and 10. The input side fiber array includes a light source (34) that emits the adjustment light and a photodetector (33) that detects the adjustment light. As seen in the drawing, the light source and the photo

detector are optically connected with the adjustment optical fiber. The adjustment light beam is caused to travel from the adjustment optical fiber (22-1) toward the fixed mirror (112a-1) and the photo detector (33) detects the adjustment light that has been reflected by the fixed mirror (112a-1) and has entered the adjustment optical fiber (see column 3, line 61 through column 4, line 34 and column 4, lines 55-65 of Brener).

12. With regard to claim 3, Brener teaches an optical switch as discussed above in reference to claim 1. Figure 7 of Brener shows the mirror array referred to in reference to claim 1. Figure 7 teaches that the tilt variable mirrors (120) and the fixed mirrors (112) are aligned in a matrix with m rows and n columns (where m and n are both natural numbers), and the fixed mirrors are thereby on the matrix with m rows and n columns (see column 4, lines 33-44 of Brener). Brener also teaches that the signal input optical fibers and the adjustment optical fibers are aligned in a matrix in accordance with the mirror array alignment (see column 4, lines 11-13). The adjustment optical fibers are arranged in the matrix so as to be opposed to the fixed mirror and the signal input optical fibers are arranged in the matrix so as to be opposed to the tilt mirrors in the mirror array (see column 4, line 56 through column 5, line 4). Also, see column 6, lines 40-59 of Brener.

13. With regard to claim 4, Brener teaches an optical switch as discussed above in reference to claim 1. Figure 4 of Brener shows the mirror array referred to in reference to claim 1. Figure 4 teaches that the tilt variable mirrors (120) are aligned in a matrix with m rows and n columns (where m and n are both natural numbers), and the fixed mirrors (112) are thereby off the matrix (see column 4, lines 33-44 and column 9, lines 40-45 of Brener). Brener also teaches that the signal input optical fibers (20) are aligned in a

matrix in accordance with the mirror array alignment and that the alignment fibers (22) can be located off of the matrix (see column 4, lines 11-115). The adjustment optical fibers are arranged in the matrix so as to be opposed to the fixed mirror and the signal input optical fibers are arranged in the matrix so as to be opposed to the tilt mirrors in the mirror array (see column 4, line 56 through column 5, line 4).

14. With regard to claims 5 and 12, Brener teaches an optical switch as discussed above in reference to claims 1 and 10. Figure 4 of Brener shows the mirror array referred to in reference to claim 1. Figure 4 teaches that the tilt variable mirrors (120) are aligned in a matrix with m rows and n columns (where m and n are both natural numbers), and the fixed mirrors (112) are thereby off the matrix (see column 4, lines 33-44 and column 9, lines 40-45 of Brener). Brener also teaches that the signal input optical fibers and the adjustment optical fibers are aligned in a matrix with the adjustment optical fibers thereby on the matrix (see column 4, lines 11-13). The optical switch taught by Brener further comprises a positional adjustment mechanism that adjusts a relative position of the input side fiber array and the mirror array in a direction crossing an optical axis of the input side fiber array, so that the adjustment optical fiber is arranged so as to be opposed to the fixed mirror by the positional adjustment mechanism (see column 6, lines 25-28 and column 7, lines 4-47 of Brener).

15. With regard to claims 6 and 13, Brener teaches an optical switch as discussed above in reference to claims 1 and 10. The array unit on the output side of the optical switch in figure 2 has a second mirror array (100b) having tilt variable mirrors (120) to deflect the signal light beams from the mirror array (100a) of the input side fiber array (20-1 through 20-j) toward the output side fiber array (25-1 through 25-j).

16. With regard to claim 8, Brener teaches an optical switch as discussed above in reference to claim 1. For the purposes of this rejection, the limitation "the semiconductor micromachine technology" as rejected above in accordance with 35 U.S.C. 112 second paragraph, has been assumed to mean any manufacturing technology for producing seminconductor micromachines that are known in the art. Brener teaches that the mirror array could be a microelectromechanical system (MEMS) device (see column 7, lines 66-67 of Brener). Brener also teaches that the MEMS device could be formed using MEMS technology (see column 8, lines 18-29 of Brener).

17. With regard to claim 9, Brener teaches an optical switch as discussed above in reference to claim 1. Brener teaches a method for adjustment of an optical fiber switch. The method comprises irradiating the fixed mirror (112) with the adjustment light beam from the adjustment optical fiber (22). The photo detector (33) measures the light quantity of the adjustment light beam that is reflected by the fixed mirror (112) and that returns to the adjustment optical fiber (22) to which the detector (33) is coupled. The mirror is then adjusted in such a way that the light quantity measured by the photo detector is maximum (see column 4, lines 55-65, column 6, lines 1-35, and column 7, lines 4-47 of Brener).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Brener (PN 6,529,652)*** as applied to claims 1 and 10 above, and further in view of ***Aksyuk et al. (EP 1,102,096)***. Brener teaches an optical switch as discussed above in reference to claims 1 and 10. Brener does not teach that the array unit on the output side of the optical switch further has a fixed mirror that reflects the signal light beams from the mirror array on the input side fiber array toward the output side fiber array. Aksyuk teaches that a fixed planar mirror could be used on the array unit on the output side of the optical switch to reflect the signal light beams from the mirror array on the input side fiber array toward the output side fiber array (see abstract of Aksyuk). It would have been obvious to one of ordinary skill in the art at the time of invention to use the fixed planar mirror on the array unit on the output side fiber array of the optical switch taught by Brener to reflect the signal light beams from the mirror array on the input side fiber array toward the output side fiber array. Motivation to do this would be to enable the input and output MEMS arrays to be positioned on the same side of the cross-connect (as shown in figure 3 of Aksyuk) to result in ease of construction (see paragraph 16 of Aksyuk).

Double Patenting

20. Applicant is advised that should claims 1, 2, 5, 6, or 7 be found allowable, claims 10, 11, 12, 13, or 14, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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DLD